

# Distinctive Characteristics

## DSA

Environmentally friendly, contains no mercury.

High contact reliability due to sealed body.

The switch is triggered when tilted beyond  $\pm 10^\circ$  of the horizontal.

PCB adaptor available as an accessory.



## DSB

Photo interrupter, rather than contacts, ensures high reliability. 1 million operations minimum.

Sealed construction for protection from environmental elements, including hydrogen sulfide, sulfur dioxide, and nitrogen hydroxide. Terminals are made of ammonia-resistant materials.

Totally sealed body allows process compatibility for time- and money-saving automatic soldering and cleaning.

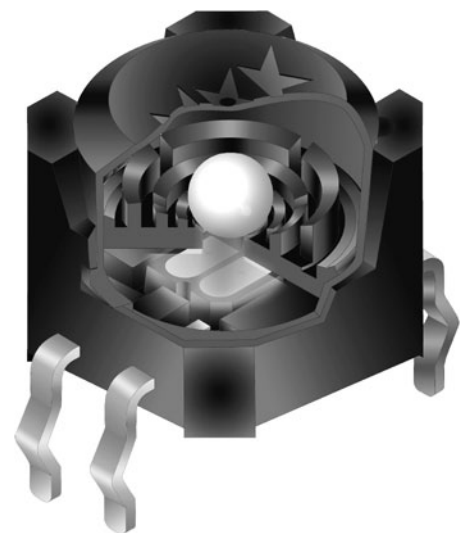
Space-saving compact dimensions allow high density mounting.

Internal steel ball movement allows functionality of  $360^\circ$  circumference rotation.

The DSB series switch is well-suited to meet product safety concerns due to normally closed (on) status.

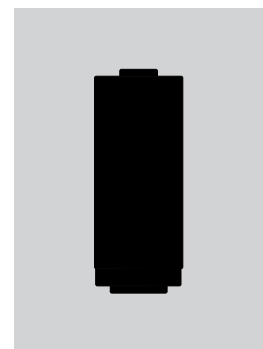
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

The switch is triggered when tilted beyond  $\pm 30^\circ$  of the horizontal.

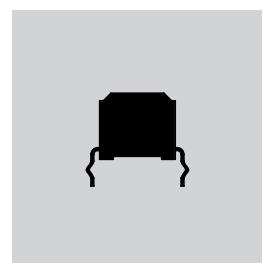


Actual Sizes

DSA



DSB



## DSA SWITCH PART NUMBER &amp; DESCRIPTION

DSA01



SPST ON – OFF

Sealed Body

## DSA SWITCH SPECIFICATIONS

## Mechanical &amp; Electrical Specifications

|                               |  |
|-------------------------------|--|
| <b>Poles and Circuits:</b>    | Single Pole Single Throw ON – OFF              |
| <b>Operating Range:</b>       | ON Angle = 10° ~ 170°; OFF Angle = 190° ~ 350° |
| <b>Resistive Load:</b>        | 0.1A @ 12V DC                                  |
| <b>Contact Resistance:</b>    | 100 milliohms maximum                          |
| <b>Insulation Resistance:</b> | 50 megohms minimum @ 250V DC                   |
| <b>Dielectric Strength:</b>   | 250V AC for 1 minute minimum between terminals |
| <b>Mechanical Life:</b>       | 100,000 operations minimum                     |
| <b>Electrical Life:</b>       | 100,000 operations minimum                     |

## Materials &amp; Finishes

|                       |                           |
|-----------------------|---------------------------|
| <b>Housing:</b>       | PBT                       |
| <b>Rubber Rings:</b>  | Nitrile Butadiene Rubber  |
| <b>Contact Balls:</b> | Brass with Silver Plating |
| <b>Terminals:</b>     | Brass with Silver Plating |

## Environmental Specifications

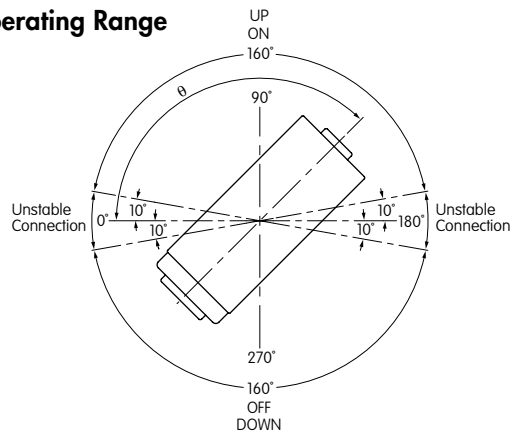
|  |  |
|--|--|
| <b>Operating Temperature Range:</b>    | -10°C ~ +70°C (+14°F ~ +158°F)   |
| <b>Storage Temperature Range:</b>      | -25°C ~ +85°C (-13°F ~ +185°F)   |
| <b>Contact Bounce (for reference):</b> | 500ms maximum  |
| <b>Humidity:</b>                       | 90% humidity for 96 hours @ 40°C (104°F)   |
| <b>Vibration (for reference):</b>      | Frequency range 10Hz ~ 500Hz for 2 hours; 2 directions; Acceleration: 0.2G                       |
| <b>Notes:</b>                          | 1. Do not install switch near vibration source.<br>2. Terminals should not be exposed to liquid. |

## Processing for AT094 PCB Adaptor

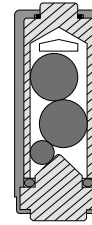
|   |  |
|---|--|
| <b>Soldering (with PCB Mount Holder):</b> | Wave Soldering: See Profile A in Supplement section.<br>Manual Soldering: See Profile B in Supplement section. |
| <b>Automated Cleaning:</b>                | Hand clean locally using alcohol based solution.   |

## DSA SWITCH SPECIFICATIONS (CONTINUED)

Operating Range

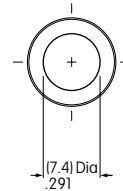
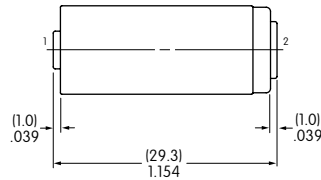
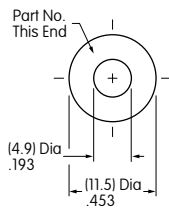


Cross Section



Allow 500ms settling time between states.

## TYPICAL SWITCH DIMENSIONS



DSA01

Terminal numbers are not on the switch.

## OPTIONAL ADAPTOR



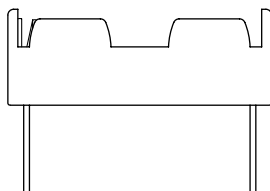
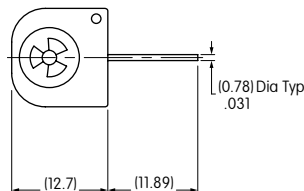
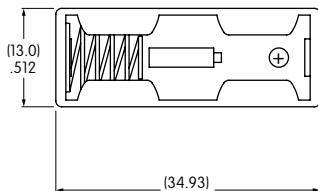
AT094  
PCB Adaptor for DSA01

### Materials:

Holder: Polypropylene  
Spring: Spring Steel with Nickel Plating  
PC Pins: Brass with Nickel Plating

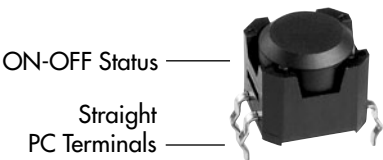


Assembled DSA Switch & Adaptor

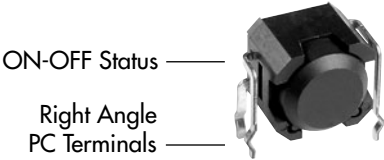


PCB Footprint

DSB SWITCH PART NUMBERS & DESCRIPTION



DSBA1P



DSBA1H

DSB SWITCH SPECIFICATIONS

Absolute Maximum Ratings  
Temperature at 25°C

|        |                             | Symbol    | Rating | Unit |
|--------|-----------------------------|-----------|--------|------|
| Input  | Forward Current             | $I_F$     | 50     | mA   |
|        | Reverse Voltage             | $V_R$     | 5      | V    |
|        | Power Dissipation           | $P_D$     | 75     | mW   |
| Output | Collector-Emitter Voltage   | $V_{CEO}$ | 30     | V    |
|        | Emitter-Collector Voltage   | $V_{ECO}$ | 3      | V    |
|        | Collector Current           | $I_C$     | 20     | mA   |
|        | Collector Power Dissipation | $P_C$     | 50     | mW   |
|        | Total Power Dissipation     | $P_{tot}$ | 100    | mW   |

Mechanical Specifications

|                  |   |
|------------------|---|
| Mechanical Life: | 1,000,000 operations minimum                          |
| Electrical Life: | 1,000,000 operations minimum using applicable circuit |

Materials & Finishes

|            |  |
|------------|--|
| Housing:   | Glass fiber reinforced polyamide (UL94V-0 flammability rating) |
| Base:      | Glass fiber reinforced polyamide (UL94V-0 flammability rating) |
| Terminals: | Phosphor bronze with tin plating                               |

Environmental Specifications

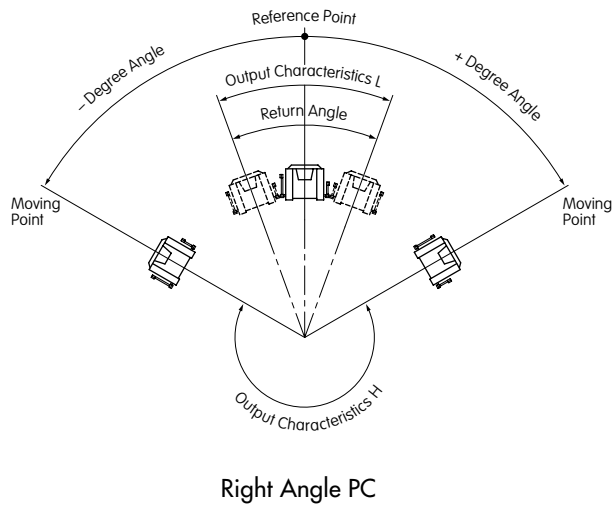
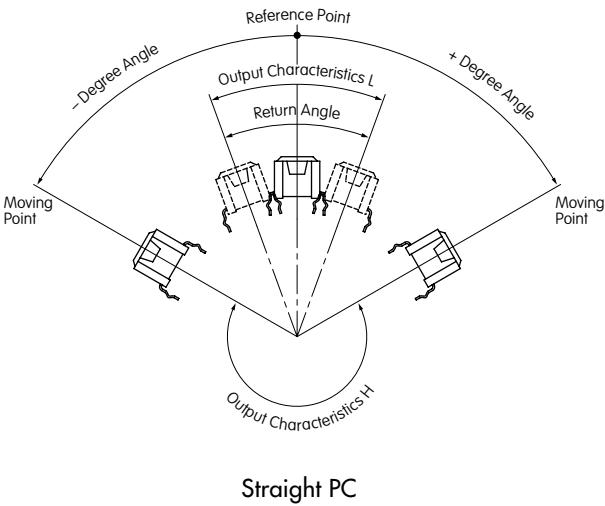
|                              |   |
|------------------------------|---|
| Operating Temperature Range: | -25°C ~ +80°C (-13°F ~ +176°F)  |
| Storage Temperature Range:   | -30°C ~ +85°C (-22°F ~ +185°F)  |
| Humidity:                    | 85% humidity for 500 hours @ +85°C (+185°F)   |
| Vibration:                   | 10Hz with peak-to-peak amplitude of 10mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 500,000 cycles |
| Shock:                       | 100G (981m/s <sup>2</sup> ) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)                               |
| Notes:                       | 1. Prevent exposure to magnetic fields.<br>2. Do not install switch near vibration source.  |

DSB SWITCH SPECIFICATIONS (CONTINUED)

| Operating Characteristics        |                                      |                                    |
|----------------------------------|--------------------------------------|------------------------------------|
| Circuit Characteristics (ON-OFF) | Operating Angle                      | Return Angle                       |
|                                  | $\pm 30^{\circ}$ to $\pm 60^{\circ}$ | Minimum $10^{\circ}$               |
|                                  | Output $V_{OL} \rightarrow V_{OH}$   | Output $V_{OH} \rightarrow V_{OL}$ |

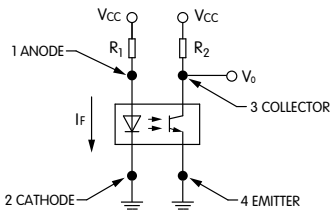
Output Characteristics  $V_{OL}$  with Photo transistor ON: 1.0V maximum (horizontal)  
Output Characteristics  $V_{OH}$  with Photo transistor OFF: 4.0V minimum (inclined at an angle of  $-60^{\circ}$  minimum)

Output Characteristics



Circuit Design Considerations

$V_{CC} = 5V$   
 $R_2 = 100k\Omega$   
 $I_F = 19mA$  ( $V_{CC} = 5V$ ,  $R_1 = 200\Omega$ )  
 $V_F$  of the LED Maximum = 1.3V

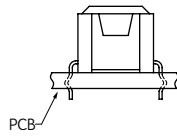


PCB Processing

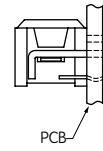
**Soldering :** Wave Soldering: See Profile A in Supplement section.  
Manual Soldering: See Profile A in Supplement section.

**Automated Cleaning:** Use alcohol based solution at  $50^{\circ}C$  maximum. Do not submerge over 2.0" (5.0cm) for 1 minute maximum. Do not use organic solvents.

## MOUNTING OPTIONS



PCB mounting option for Straight PC

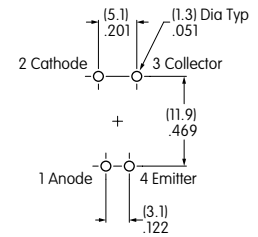
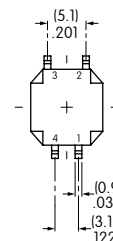
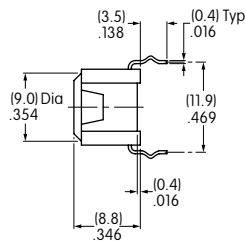
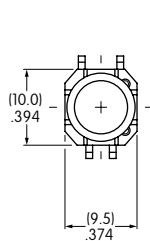


PCB mounting option for Right Angle PC

Install switch at an angle less than  $\pm 3^\circ$  from the mounting surface.

## TYPICAL SWITCH DIMENSIONS

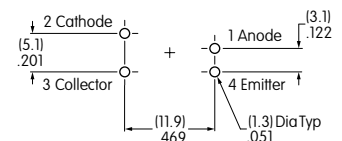
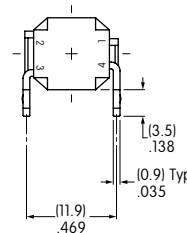
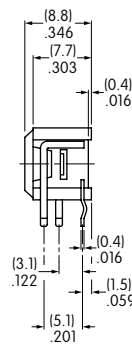
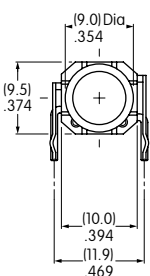
### Straight PC



**DSBA1P**

Terminal numbers are on bottom of switch.

### Right Angle PC



**DSBA1H**

Terminal numbers are on bottom of switch.

# AMEYA360

Components Supply Platform

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